

### **Amendments to the Claims**

This listing of claims will replace all prior versions and listings of claims in this application:

### **Listing of Claims**

Claim 1 (canceled)

Claim 2 (new): A method of transmitting at least one digital code over a network carrying AC current comprising:

transmitting a signal corresponding to the code over the AC current network using the AC current for determining timing of transmission,

wherein, for each code, the signal is a sum of sine waves of several frequencies with phases selected between 0 and  $2\pi$  for each frequency,

wherein the same frequencies are used for all codes, and

wherein the set of phases is unique for each code.

Claim 3 (new): The method of Claim 2, wherein the signal for at least one code is transmitted from storage.

Claim 4 (new): The method of Claim 2, wherein the phases are selected to minimize the crest factor of the signal.

Claim 5 (new): The method of Claim 2, wherein the phases are selected randomly or pseudo-randomly between 0 and  $2\pi$ .

Claim 6 (new): The method of Claim 2, wherein the frequencies are equidistant.

Claim 7 (new): The method of Claim 2, wherein the at least one digital code identifies a transmitting device.

Claim 8 (new): A method of detecting transmission at least one digital code over a network carrying AC current comprising:

for each code, determining a phase  $\phi_i$  between 0 and  $2\pi$  for each of several frequencies  $f_i$  so that the set of phases is unique for each code;  
receiving a signal over the AC current network using the AC current for determining timing of transmission;  
for each frequency  $f_i$  determining a complex Fourier coefficient of the signal  $C_i$ ;  
calculating a sum by adding for each pair (i, i-1)  
 $\text{sign}(\text{Re}(C_i \cdot (C_{i-1})^* \cdot \exp(-j \cdot (\phi_i - \phi_{i-1}))))$ ; and  
detecting the digital code when the sum is higher than a threshold.

Claim 9 (new): The method of Claim 8, wherein the phases are selected to minimize the crest factor of the signal.

Claim 10 (new): The method of Claim 8, wherein the phases are selected randomly or pseudo-randomly between 0 and  $2\pi$ .

Claim 11 (new): The method of Claim 8, wherein the frequencies are equidistant.

Claim 12 (new): The method of Claim 8, wherein the at least one digital code identifies a transmitting device.